

LOWER KLIKITAT HABITAT ENHANCEMENT PROJECT 9705600

SHORT DESCRIPTION:

Improve habitat and riparian conditions in tributaries streams of the Klickitat River with in-channel placement of large woody debris and rock to enhance pool formation and capture spawning gravels, revegetation of riparian areas, stabilization of erodible banks, augment summer flows, and construction of grazing exclosures.

SPONSOR/CONTRACTOR: YIN

Yakama Indian Nation Fisheries Program
Lynn Hatcher, Fisheries Program manager
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SUB-CONTRACTORS:

Other agencies involved with this project but not anticipated to receive funding through Bonneville include the Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and Natural Resource Conservation Service. Multiple private and public sub-contractors will be used on this project, as needed, to complete work tasks.

GOALS

GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Increases run sizes or populations, Provides needed habitat protection

ANADROMOUS FISH:

Habitat or tributary passage

NPPC PROGRAM MEASURE:

no response

RELATION TO MEASURE:

Unknown

TARGET STOCK

Klickitat River Winter Steelhead

Klickitat River Summer Coho

Klickitat River Spring Chinook

Klickitat River Summer Steelhead

LIFE STAGE

Spawning, fry development, summer and winter juvenile rearing

Spawning, fry development, summer and winter rearing

Summer and winter juvenile rearing

Spawning, fry development, summer and winter juvenile rearing

MGMT CODE (see below)

N, W

N

N, W

N,W

AFFECTED STOCK

Resident Cutthroat Trout

Resident Rainbow Trout

BENEFIT OR DETRIMENT

Beneficial

Beneficial

BACKGROUND

STREAM AREA AFFECTED

Stream name:

Swale Creek, Little Klickitat River, Summit Creek, White Creek, Trout Creek, Dillacourt Canyon

Stream miles affected:

15

Hydro project mitigated:

Not Known

LAND AREA INFORMATION

Subbasin:

Klickitat River

Land ownership:

private

Acres affected:

~540

Habitat types:

HISTORY:

N/A

BIOLOGICAL RESULTS ACHIEVED:

Monitoring and implementation is just beginning on this project. Results will be analyzed at a future time.

ADAPTIVE MANAGEMENT IMPLICATIONS:

Through restoration efforts, it is expected that critical habitat for salmonid production will be increased and can be demonstrated. Projects of a similar nature conducted in the Northwest have shown positive results. Through monitoring, the project can be assessed for its ability to meet target objectives for riparian conditions and in-channel habitat, as well as judge effects on production of salmonids. This knowledge can be applied to future projects for determining expected outcomes and benefits to habitat enhancement.

PURPOSE AND METHODS**SPECIFIC MEASUREABLE OBJECTIVES:**

The objective of the project is to improve spawning, rearing and holding habitat, stabilize stream banks and channels, revegetate riparian corridors with beneficial deciduous and coniferous species, deter grazing impacts to the riparian area and stream channel, and provide adequate summer flows for fish passage and rearing. The project work is also expected to improve water quality by reducing erosion, filtrating and storing fine sediments, augmenting canopy cover for temperature moderation and reducing livestock waste from entering waters. Through restoration efforts on the channel, available habitat is anticipated to increase by at least two-three fold for spawning, juvenile rearing, velocity refugia, and adult holding. These improvements should benefit both anadromous and resident salmonid populations (steelhead, chinook and coho salmon, rainbow and cutthroat trout) in the Klickitat River. Ambient monitoring of habitat conditions and fish populations before and after completion of project work will quantify whether objectives were attained.

CRITICAL UNCERTAINTIES:

It is expected that the project will provide immediate and future benefits to fish production, but the exact gains will not be known until monitoring is completed. In addition the length of time for complete stream recovery, or period until desired conditions are achieved, is not completely known. For example, optimal benefits from the revegetation of channel margins and riparian areas will require several years of plant growth.

BIOLOGICAL NEED:

A deficiency of in-channel pool frequency and depth for summer and winter rearing, spawning gravel area and quality, velocity breaks for juvenile and adult holding, and overhead cover, has been identified in segments of these tributaries. In addition, some riparian areas along these project streams lack ground cover, trees for long-term recruitable large woody debris, shade, and bank stability. Adequate flows have also led to loss of summer rearing habitat and adult holding water. All of these habitat deficiencies have contributed to a reduction in fish populations. At least three of the adomous runs in the Klickitat River (coho and spring chinook, winter steelhead) are considered depressed stocks in the Washington State Salmon and Steelhead Stock Inventory (SASSI, 1992).

HYPOTHESIS TO BE TESTED:

N/A, not solely research.

ALTERNATIVE APPROACHES:

Approaches were considered for individually treating in-stream conditions, or riparian stands, or land management. These approaches have been tried in other areas with limited success. This project attempts to restore both habitat and riparian conditions, as well as work with landowners to correct upslope and headwater problems. In order to maximize benefits to fish habitat, cumulative impacts in the drainage to the channel and riparian stand must be assessed and addressed, as this project proposes to do.

JUSTIFICATION FOR PLANNING:

N/A, ongoing project for implementation with effectiveness monitoring

METHODS:

Much of this project area contains private lands. This project will continue to coordinate and seek cooperation from landowners to permit restoration work on their lands. Several landowners have already expressed interest in stream restoration and would like to participate in this project. In areas of critical habitat where cooperation can not be obtained, easements or land purchase may be sought to allow restoration work to take place. All specific project sites will have a design and monitoring plan completed by the grantee or a subcontractor with restoration experience. Monitoring will be conducted both before and after restoration work. The monitoring will assess the habitat features (large woody debris, pool area and frequency, residual pool depth, spawning gravel quality and quantity), channel characteristics (wetted and bankfull width and depth), riparian condition (canopy cover, species composition), and limited fish population estimates (spawner surveys, electroshocking, snorkeling). The monitoring data will be analyzed to compare changes before and after the restoration work. The design plans will include a description of existing conditions, actions needed to restore the channel and riparian areas to target conditions, logistics to complete the work, expected benefits from the work. Where channels are deficient in rearing habitat, restoration efforts may include placement of large woody debris, boulders, and or bank deflectors in the channel. This work is also expected to help retain/store spawning gravels. In areas of active bank erosion, bio-engineering practices may be utilized such as establishment of dense woody vegetation for rooting strength, placement of large rock at toes of erosion, and construction of bank deflectors to direct flows away from banks. In addition, exclosure fences may be installed where grazing activities would continue to thwart establishment of beneficial vegetation and cause ground disturbance and bank erosion. Within riparian areas, stands with sparse or no vegetation may be inter-planted with appropriate coniferous or deciduous species to provide future wood recruitment to the channel, shade for temperature moderation, allochthonous nutrient delivery, and bank stability. Irrigation diversions which cause inadequate summer stream flows for fish rearing and migration may have water rights purchased to retain in-stream flows. Upon review and acceptance of the plans, the work will be carried out by the grantee or a subcontractor. The work will be evaluated by the grantee for its consistency in meeting the design plans and project objectives.

PLANNED ACTIVITIES

SCHEDULE:

<u>Planning Phase</u>	<u>Start</u> 1997	<u>End</u> 2001	<u>Subcontractor</u> possibly the WDF&W
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<u>Task</u> Initial monitoring has begun and will be ongoing through September of 1998 for various stream segments in the project area. Design planning has begun and will also be completed by September of 1998, as monitoring data is available and has been analyzed. Final or post monitoring will be accomplished in the spring and summer of 2001.			
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<u>Implementation Phase</u>	<u>Start</u> 1997	<u>End</u> 2001	<u>Subcontractor</u> various
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<u>Task</u> Stream Channel and Habitat Work: Large woody debris and boulder placement, bank deflectors, in-channel structures; Riparian Enhancement: Revegetation, livestock exclosures, erosion control; Land and Water Rights Easements/Purchase.			
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<u>O&M Phase</u>	<u>Start</u> 1999	<u>End</u> 2001	<u>Subcontractor</u> various
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<u>Task</u> Additional work as needed to maintain in-stream and riparian projects.			
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PROJECT COMPLETION DATE:

2001

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

Aquisition of Hydraulic Project Approvals and Shoreline Variance Permits. Easements or purchase of land or water rights. Lack of private landowner cooperation in critical stream segments.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:

Through these restoration efforts, habitat features that are limiting fish populations are expected to, at a minimum, be increased by two to three fold. This increase in critical habitat area should promote recovery and resilience of fish stocks. Monitoring work will further determine the net benefits of the project, and identify limitations or areas of improvement.

Present utilization and conservation potential of target population or area:

Most of the project area is currently used for agricultural purposes, grazing, and/or timber harvest. Fish populations in the streams are substantially depressed, partly due to past and current riparian and habitat degradation. Existing conditions are lacking in habitat features and riparian vegetation.

Assumed historic status of utilization and conservation potential:

The project streams historically were assumed to contain healthy riparian and wetland communities. Habitat conditions were also assumed to be of high quality with considerable pool area, spawning gravels, in-channel woody debris, sufficient summer flow, moderated peak flows, and adequate water temperatures. Historical information on run sizes to the Klickitat River and its tributaries indicates that considerable habitat was available, and necessary, to sustain the high level of production.

Long term expected utilization and conservation potential for target population or habitat:

The long term goal for these project streams is to restore habitat and riparian stands to conditions similar to historical levels and favorable for salmonid life history requirements. To accomplish this, land practices that are causing impacts need to be modified or curtailed, riparian areas need to be revegetated with plants that historically occurred at these sites, and habitat features improved until such time that natural processes can supply them.

Indirect biological or environmental changes:

None known

Physical products:

In the project stream segments, the restoration work is expected to increase available habitat for spawning, rearing, velocity refuge and adult holding by 2-3 times over that of existing conditions. To accomplish this it is expected that approximately 25 locations will receive boulders and/or large woody debris. Roughly 8 additional sites may also need bank erosion control practices which may include bank deflectors, rock placement at toes, and revegetation. Riparian restoration/revegetation work is expected to be performed on scattered locations over a total stream length of 21,000 feet. Grazing exclosure fencing is needed in some areas and is anticipated to be installed along approximately 16,000 lineal feet of stream frontage. Land acquisition or easement is expected to be necessary on approximately 200 acres of land to permit restoration work on critical stream segments and protect them from future impact.

Environmental attributes affected by the project:

Moderation of water temperatures with improved riparian conditions and deeper pool habitat. Reduced grazing impacts on riparian vegetation and stream banks with the use of exclosure fencing and livestock control. Increased pool area and depth, spawning gravel retention, and large woody debris frequency from placement of in-stream rock and large wood. Decreased fine sediment delivery to the stream system by enhancing riparian vegetation and ground disturbance which will help filtrate sediments and stabilize banks.

Changes assumed or expected for affected environmental attributes:

Near term, the project's plan to introduce boulders and large wood to the channel is expected to enhance juvenile rearing and adult holding habitat by creating additional pool area and depth, and velocity breaks for refuge during peak flows. This material will also capture and retain spawning gravels. Deflectors and bank stabilization should also curb erosion, thereby reducing fine sediment delivery. Riparian revegetation work and grazing exclosures should also begin to reduce fine sediment delivery and stabilize banks and channels.

Long term, riparian restoration and grazing exclosures will provide increased canopy cover for moderating stream temperatures, eventually supply large woody debris recruitment to the stream, and maintain stable banks and channels.

Measure of attribute changes:

Exact reduction level on sediment delivery unknown. However, it is expected that control of livestock grazing, improvement in riparian

arian conditions, and measures taken to stabilize the banks and channels will substantially reduce fine sediment deliver to the streams.

Assessment of effects on project outcomes of critical uncertainty:

Monitoring of conditions before and after project completion should quantify if goals and objectives have been attained.

Information products:

Monitoring data, monitoring summary and findings, analysis of limiting habitat and riparian factors, project design plans, compliance evaluation of project implementation, evaluation of project results to expected goals and objectives

MONITORING APPROACH

Review of monitoring data and results should provide the region with the necessary information to evaluate the project's ability to enhance riparian and habitat conditions.

Provisions to monitor population status or habitat quality:

The monitoring component of the project should quantify how riparian and habitat conditions have been improved. Annual spawner surveys and supplemental population estimates in the project streams will provide further information on the status of target stocks.

Data analysis and evaluation:

The monitoring data collected before and after project completion will be compared. The post completion monitoring data will also be evaluated to determine if targets for habitat and riparian condition have been attained. Selected parameters of the two data sets (pool area, LWD frequency, residual depth, stream width and depth, canopy cover, fish density) will be evaluated for statistical difference.

Information feed back to management decisions:

Monitoring data collected prior to project implementation will guide and focus planning efforts. Riparian restoration and habitat improvement designs will be tailored to the findings of the monitoring.

Critical uncertainties affecting project's outcomes:

Partial enhancement of riparian and habitat conditions is expected with this project, but the time frame will be dependent upon flow regimes and weather conditions after project completion. Future flow regimes and weather can not generally be predicted or resolved. However, the project's outcome could be better assessed if monitoring was conducted beyond the 5 year time frame of the project. Some habitat and riparian changes are not expected to be detectable within the first 5 years (eg riparian improvement). The exact level of benefit to riparian conditions and habitat is also uncertain, though anticipated. Monitoring as described for this project, and conducted on similar restoration work, should over time provide greater prediction capability on future outcomes.

EVALUATION

Assessment of monitoring results should allow the region to evaluate the effectiveness of the project work. The monitoring data and analysis should describe how riparian and habitat conditions have changed, or not changed, due to project work. The projects success should be apparent with improved frequency or quality of habitat and riparian conditions, as quantified with monitoring.

Incorporating new information regarding uncertainties:

All new information will be assessed and considered in making improvements to the project planning or implementation.

Increasing public awareness of F&W activities:

The project's tact of working with other agencies and landowners will increase awareness of restoration efforts. Positive results of the work will also be communicated to the local community. At some sites the work will be visible to the general public due to its relatively close proximity to roads and highways. Possibly, interpretive signs could be placed near project sites to inform the public of the work and effort completed.

RELATIONSHIPS

RELATED BPA PROJECT

5512600 Upper Klickitat Meadow and Crossing Rehabilitation.

RELATIONSHIP

Involves restoration work in the upper Klickitat River above this project work

OPPORTUNITIES FOR COOPERATION:

Coordination continues on this project with the Washington Department of Fish and Wildlife, Natural Resource Conservation Service, U.S. Fish and Wildlife Service, and Northwest Services Academy. Cost sharing of equipment and materials may be available through the NRCS and USF&WS. Several private landowners have been contacted and are interested in stream restoration efforts. coordination and cooperation will continue to be sought with other landowners.

COSTS AND FTE

1997 Planned: \$215,280

FUTURE FUNDING NEEDS:

PAST OBLIGATIONS (incl. 1997 if done):

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$465,000	20%	80%	0%
1999	\$465,000	10%	85%	5%
2000	\$465,000	10%	80%	10%
2001	\$30,000		0%	10%
90 monitoring in 2000				
2002	\$0			

<u>FY</u>	<u>OTHER FUNDING SOURCE</u>	<u>AMOUNT</u>	<u>IN-KIND VALUE</u>
1998	USFS (Staff Time)	~\$20,000	\$5,000
	WDFW (Staff Time)		\$2,000
	NRCS (Staff Time)		
1999	WDFW (Staff Time)		\$5,000
	NRCS (Staff Time)		\$2,000
2000	WDFW (Staff Time)		\$5,000
	NRCS (Staff Time)		\$2,000
2001	WDFW (Staff Time)		\$5,000
	NRCS (Staff Time)		\$2,000

OTHER NON-FINANCIAL SUPPORTERS:

Individual landowners, Northwest Services Academy

LONGER TERM COSTS: Not expected, though additional monitoring time/costs would be beneficial.

1997 OVERHEAD PERCENT: 26.8%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:

Total direct project cost

SUBCONTRACTOR FTE: 5

SUPPLEMENTAL FACTORS

SUPPLEMENTAL ANADROMOUS FISH EVALUATION FACTORS:

The project continues monitoring, planning and implementation of habitat improvements and riparian restoration for anadromous stocks.

SUPPLEMENTAL RESIDENT FISH EVALUATION FACTORS:

Though the project is targeted toward improvement of conditions for anadromous stocks, the work will also benefit resident fish habitat and adjacent riparian stands.

SUPPLEMENTAL WILDLIFE EVALUATION FACTORS:

The project is targeted toward anadromous stocks, but improvements in riparian conditions, wetlands, and stream flows should benefit a variety of wildlife species.